INDUSTRIAL POLLUTION IN RATMALANA AND MORATUWA AREAS

A PRELIMINARY STUDY

CENTRAL ENVIRONMENTAL AUTHORITY

INDUSTRIAL POLLUTION IN RATMALANA AND MORATUWA AREAS - A PRELIMINARY STUDY.

C O N T E N T S

APPENDICES :

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5. Sketch Map of Study Area.

6. GCEC Industrial Emission Questionnaire.

7. A Survey of the Industrial Pollution in the Moratuwa Area - Jayatissa P.M. (1981).

INDUSTRIAL POLLUTION IN RATMALANA AND MORATUWA AREAS.

A Preliminary Study :-

1. Summary:

In a preliminary survey conducted, in the North Moratuwa and Ratmalana Areas, it was revealed that the environmental problems as a result of industrial pollution were very acute. Aquatic bodies fringing the area, were found to be highly polluted and causing severe health hazards to the resident population.

These problems seem to have arisen primarily due to a lack of land use planning by the relevant authorities and ineffective legislature with respect to industrial discharges.

Formulation of standards for air, water and land and legislation relevant to pollution control is urgently required.

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2. INTRODUCTION :-

2.1 Objectives :-

To study the nature and extent of Industrial Pollution in Moratuwa and Ratmalana areas and to suggest remedial measures.

2.2 Study Area :-

a. North Moratuwa and Ratmalana Industrial Area.

b. Aquatic bodies fringing the study area.

2.3 Aspects investigated :-

Since the main objective of the study was to examine the nature and extent of industrial pollution in the above area, several visits were made, both to the industrial area and to Lunawa Lagoon and Weras Ganga, running through the study area. This river has a connection to the main Bolgoda lake system. Due to lack of time, an extensive study of the process and operations of individual factories could not be done.

The study area proved to be highly residential and densely packed industry wise. The existence of several types of industries were observed, mainly non-agro based industries.

These included :

i. Paint industries.
ii. Galvanising industries.
iii. Asbestos industries.
iv. Dyeing & Finishing industries.
v. Pharmaceutical industries.
vi. Battery (Wet & Dry) Manufacturers.

An investigation into the discharges in the area were made and it was found that a major part of the effluents were released via surface drainage to Lunawa lagoon and Bolgoda Lake.

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An inventory of the existing industries in the study area was listed (Annexure 1).

The existing legal framework was studied and recommendations are put forward (6).

3. Background:-

A large number of industries have come into existence in Ratmalana and Moratuwa North, during the last two decades. These have been established particularly in areas which have been zoned as provisional residential areas, where the Chairman of the local authority has power to approve non-residential activities, provided they do not cause nuisance to the residential population. However, most of the industries in the area are highly polluting and cause considerable nuisance to the residential population.

As a result of numerous complaints made by residents of this area, surveys have revealed that the problem is very acute. Improper land-use has led to industries being established side by side with residential buildings. Thus, a zoning scheme was formulated by the UDA for both Moratuwa and Ratmalana areas where an accurate land-use survey was made.

Further, regulations were made for Colombo and other urban areas where detailed specifications regarding industries permissible in primary residential, mixed residential, commercial and special industrial zones have been provided by the UDA.

All industrial projects in declared areas have now to be approved by the UDA, and the local authorities given the power to ensure that final development conforms to the conditions given in the approval.

Due to the haphazard development in the study area, immediate dangers of industrial pollution are now experienced, and has become an enormous threat to environmental quality and human life.

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4. Research in Area :

Existing Publications:

1. Jayatissa P.M. (1981)

A survey of the Industrial Pollution in the Moratuwa Area - Report I:

Part II of the above report is currently being prepared by Mr. E.E. JeyaRaj (CISIR), to be published shortly.

Analytical data involving the analysis of effluents and water quality studies of the Bolgoda Lake have been carried out by Mr. M. Ponnambalam of the Division of Occupational Hygiene, Ministry of Labour. This work is unpublished to date, and is due to be released soon.

On discussion with several relevant personnel in this field, it was revealed that they were concerned and willing to carry out further extensive investigations.

i. Dr. Lakdas Fernando, Head,
Textile Technology Division,
University of Moratuwa.

A survey of Textile Industries in area, with Special Emphasis on Effluents (Textile Effluents)

A fully equipped laboratory is available at this University to deal with the above research. He requests funding for the study to be conducted by him and postgraduate students.

ii. Mr. H.V.C. Fernando,
Dy. Director (Marine),
Ministry of Fisheries, is interested in studying the pollution aspects of the Lunawa Lagoon if financial assistance were provided.

iii. Environmental Officers (Protection Division) of the Central Environmental Authority, are willing to assist experts on these research programmes.

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5. The Nature & Extent:

The industrial pollution problems in the Ratmalana & Moratuwa areas have arisen primarily due to a lack of land-use planning by the concerned local authorities and the tame and ineffective legislative measures to control industrial discharges.

The industrial development of the Ratmalana/Moratuwa areas has been outlined earlier (3) in this report, and it is readily acknowledged that the benefits appreciated, such as employment creation and industrial output are valuable national assets, besides development as considered in the local context. However, it is felt that to maintain and sustain viable local industries and to promote further industrial growth, precautionary measures should be implemented to ensure the environment is not irrevocably disrupted.

Over the years a wide range of industries have been set up in the study area. They vary in age, scale and process. Industries generating air, solid and liquid wastes are present in an area which has a greater density of industries than the IPZ.

Of particular interest are those industries involved in wet processes where water is needed for the manufacture of the product, e.g. two common industries are Textile Printing and Chemical Processing. The industrial effluent flowrates from these industries are relatively large, and the characteristics of effluent vary from factory to factory, depending on the process used (Annexure 2).

The common factor in virtually all the industries of the area is, that no waste treatement is carried out. Furthermore, in nearly all the cases the effluent is discharged directly into public drains.

The haphazardly distributed, unlined effluent channels that carry untreated effluents from these industries finally fall into two major water bodies namely the Bolgoda Lake and the Lunawa Lagoon.

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These industrial effluents could be broadly divided into four groups :

i. Organic & Inorganic Wastes.
ii. Chemical Wastes.
iii. Heavy Metals.
iv. Hot Water.

It is well known that any water-body has only a limited capacity to dilute man-made waste products. Lagoons are especially sensitive to this factor, the dilution capacity being small or neglegible.

Thus it is clear that continued discharge of relatively small quantities of untreated effluents may lead to serious, even localized, water pollution, human health hazards and decline in fishery production.

a. BOLGODA LAKE SYSTEM :

This consists of two major parts, i.e. North & South Bolgoda Lakes, connected by the broad and slow Bolgoda River. Most of the industrial effluents drain into the Weras Ganga (North Bolgoda Lake) in the Borupana area (Annexure 5). Some research about the nature of pollution of water in this area has been carried out by the Division of Occupational Hygiene & CISIR. Another major pollutant is, apart from the flow of industrial effluents the dumping of sawdust from furniture manufacturing industries on the Western banks of the North Bolgoda Lake.

Since this is a free flowing large water body the nature and extent of pollution during the rainy and dry seasons should be considered separately. In the rainy season, the effluents gets diluted by the self-purification process of the river, and this may have immediate effects on the plant and animal life of the Lake or adjacent areas. However, this could lead to a more dangerous, long-term hazard due to bioconcentration, bioaccumulation and biomagnification of the pollutants along the food chains, where finally man will be badly affected. The long-term effects of continuous and

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apparently low level discharges are virtually unknown. This needs greater concern of the relevant authorities.

Conversely, during the dry weather flow there is very little or no self-purification process of the water body as the volume of water and the rate of flow are very low.

Therefore, concentration of toxic pollutants takes place at discharge points causing immediate hazards to plant and animal life in the lake as well as in the surrounding areas.

b. LUNAWA LAGOON :

There is no major supply to this lagoon other than the surface drainage from a network of drains which carry industrial effluents from the surrounding industries. A few decades ago, this was known to have been connected to the Bolgoda Lake where now a big land mass exists.

The opening of the Lagoon to the sea, just South of Angulana Railway Station is normally blocked by sandbars except during the heavy rainy season, when the pressure of water in the Lagoon is strong enough to break up the sand barriers. The flushing of the Lagoon takes place only at this stage. Because of this land locked nature of the Lagoon, it practically acts as a pollutant trap. This was quite evident from the following observed features :-

1 There were signs of eutrophication indicating the presence of organic nutrients.

2 The Lagoon had become heavily deprived of oxygen. Eruption of air bubbles and smell of toxic gases were good indicators

3 Colourful patches of water in some parts of the Lagoon probably due to the drainage of textile dyes into the Lagoon.

4. Lack of mangrove vegetation surrounding the Lagoon.

5 A few species of fish were observed, possibly those that can tolerate low oxygen concentrations.

6 According to inhabitants of the area, adjacent land which had been used for paddy cultivation have now been abandoned.

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7. Less fishing activities take place, due to low stocking density of fish.

8 The stagnating water in the Lagoon has made it a mosquito breeding ground; species that carry filariasis are said to be abandant in the area.

Visually the extent of pollution in the Lunawa Lagoon is obviously much greater when compared to the Bolgoda Lake. However, there is no research available at present on the nature or extent of pollution in this Lagoon.

GROUNDWATER CONTAMINATION:-

Groundwater contamination is a definite possibility. As mentioned previously, the area is densely populated with many housing units and well water is a major source of water supply. Contamination of this water could lead to a serious deterioration in the health status of the resident population.

Bearing in mind, the seasonal fluctuations in rainfall, it is apparent that the dry season flow in the public drains comprises of relatively concentrated industrial effluents, and can be termed a potential hazard to the resident population. During the wet season, the drains tend to spillover and industrial effluents, although diluted by rainwater, collect in small ponds, gardens and low-lying areas. There have been cases where productive paddy lands have been made redundant due to this intrusion. The financial and economic loss to the smallholding cultivator is devastating. The accumulation of polluted water in small pools is a potential breeding site for mosquito larvae some of which, transmit the disease filariasis, which is endemic in the area.

6. Legal Framework:

This section is written after consultation with Members of the Urban Development Authority (UDA) and the Greater Colombo Economic Commission (GCEC). The experience they have gained is invaluable with respect to pollution control legislative measures. Both institutions have been recently created by Acts of Parliement, to promote integrated economic, social and physical development of areas under their Authority.

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One apparent shortfall is the lack of control over industries which were established prior to the creation of these two Acts. Approval for these industrial projects were obtained by previous local authorities, which did not give due regard to land-use planning or environmental considerations such as air pollution, solid waste disposal, liquid effluents and noise and vibration from industries. Consequently, it is very difficult for the UDA and GCEC to function and implement their environmental clauses prescribed in their respective Acts. The UDA/GCEC Authorities have control over newly established industrial projects which have to receive approval from the UDA/GCEC respectively. The Authorities can stipulate conditions on these industries and ensure that discharges are of a certain quality prior to release to the environment. As the area has been mapped out into land-use zones, such as residential, commercial and industrial (light and heavy), the siting of industries can be more optimally located, facilitating the control, inspections and monitoring of these establishments.

URBAN DEVELOPMENT AUTHORITY:-

Although lists and regulations of dangerous and offensive trades (see Annexure 3), have been drawn up by the UDA, the Authority has not developed any standards or controls. It presently seeks expert advice from the CISIR, on any regulations. The Urban Development Authority will only inspect factories if complaints have been received from the public, and approval for the factory has been granted by the UDA.

If the factory is responsible for discharging wastes above the recommended levels and is carrying on nuisance or offence without due consideration, the UDA has provisions to take the offender to Court. However, presently the UDA does not have any monitoring scheme in action, and as there are only a limited set of regulations which are site and factory specific the necessity to implement a continuous monitoring scheme has not arisen as yet.

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GREATER COLOMBO ECONOMIC COMMISSION:-

The Greater Colombo Economic Commission (GCEC) operates on a slightly different procedure, through two units : the Planning Unit and the Environment Unit. Initial site approval is obtained from both units after inspection of the site. A detailed breakdown of the procedures and operations involved are recorded and air, liquid and solid wastes are inventorized (Appendix 2). The GCEC has, after consultation with pollution experts, recommended certain standards (Appendix 4), for emissions and discharges from industries within their Authority. Furthermore, the GCEC has an operational treatment plant for wastewater discharges within the IPZ. Industrial discharges have to conform to certain tolerance limits to be acceptable for treatment : which in some case may require preliminary treatment at factory site prior to discharges are mixed with domestic wastes and then treated at the treatment plant.

As it is not possible to treat all discharges in the area, a standard for discharges into Inland Surface Water (Refer Appendix 4), has been drawn up by the GCEC. If industries contravene this regulation, they are liable for prosecution under the Public Nuisance Section No. 98 of the Code of Criminal Procedure Acct No. 15 of 1979.

It is anticipated that the GCEC will set up a laboratory for analysing and monitoring industrial effluents and water bodies, however, as their present standards are only recommended standards and not statutory legislations, the setting up of a laboratory will only be given priority once the Government does the needful by setting up standards and enforcing the regulations from source to Court. Presently, the legal provisions to control pollution are scattered in various Acts and Laws dating back to 1940. Although recent Acts have included 'Environmental Clauses', no forthright means of prosecution are available apart from the Public Nuisance Section of the Code of Criminal Procedure Act No. 15 of 1979.

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It is advisable to make provision for legislative measures in one Act, for instance, to create a 'Control of Pollution Act', which will include guidelines to consider environmental objectives (with enforceable standards) and a means of implementing these objectives. The National Environmental Act No. 47 of 1980 is the preliminary step towards achieving this goal. However, the lack of both standards and a process of legal enforcement is the major drawback in the management of the Environment in Sri Lanka.

7. Recommendations:

7.1 A thorough industrial inventory should be carried out in the Ratmalana/Moratuwa area investigating :

7.1.1
a. the types of industry
b. age and size of plant
c. consumption and source of raw materials including water and fuel
d. composition and quantities of wastes generated
e. treatment facility

A record sheet similar to that used by the GCEC would be appropriate (Annexure 2).

7.1.2 Each industry should maintain a monthly record of industrial wastes.

7.2 Concurrently, a monitoring scheme utilizing the services of the Environmental Laboratory of the University of Moratuwa, CISIR, Department of Labour, Division of Occupational Hygiene and any other interested agencies should be implemented immediately. Monitoring of air, land and water should be included.

7.3 A means of treatment/control and recycling of waste water should be investigated by the NWS&DB, assessing costs of a relevant closed, lined, sewerage and drainage system connected to a treatment facility.

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7.4 A similar exercise in costing should be carried out for controlling air pollution at factory source. The factories can be identified through the industrial inventory mentioned above.

7.5 The local authority should assess a means of collection, transportation and disposal of solid waste.

7.6 A preliminary study of future industrial expansion in the area should be carried out, to assess future water, energy and population demands, to be included in a Land-use Plan.

7.6.1 To facilitate environmental assessment of new projects, an EIA should be carried out by relevant agencies.

7.7 An Integrated Research and Coastal Management Plan should be carried out in Lunawa Lagoon and Bolgoda Lake system, to assess the productivity of the Lagoon and potential for further improvement. Bioaccumulation of residues in aquatic food chains and biological control of pests are two research topics which would of immense value, if a research grant is available.

7.8 A possible compensation or insurance scheme could be set up to compensate cultivators and landowners for loss of productive land if the cause of decline can be identified to industrial pollution.

7.9 Legislation with regard to pollution control is urgently required. Standards for air, water and land should be formulated and a rapid means of legal procedure for fining offenders should be implemented. A penalty that would dissuade the offender or the offence to be perpetrated again is necessary.

7.10 Tax relief for industries purchasing and operating pollution control equipment may encourage the promotion of a cleaner environment.

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7.11 A statutory act should be passed by Parliament for the control of pollution which provides guidelines, objectives and legal procedures for pollution control and monitoring.

8. Acknowledgements:-

Helpful discussions with Mr. M. Ponnambalam are gratefully acknowledged as are useful information provided by Mr. N.D. Dickson of the UDA, Mr. R. Bandaratilake - GCEC, Mr. E.E. JeyaRaj - CEA and Mr. H.V.C. Fernando, Ministry of Fisheries.

Special thanks to the Industrial Development Board, Ratmalana, for providing an inventory of Industries in the study area.

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ANNEXURE 1 (A)

APPROVED INDUSTRIES IN RATMALANA ELECTORATE

	Name and Address	Produce
1	Associated Battery Manufacturers (Ceylon Limited Katukurunduwatta Mawatha Off Attidiya Road, Ratmalana. Office - 481, Darley Road, Colombo 10.	Accumulators for meter vehicles.
2	Asbestos Cement Industries Limited Katukurunduwatta Off Attidiya Road, Ratmalana. Office - 175, Armour Street, Colombo 12.	Asbestos Cement Products
3	A C Atapattu 31/8, Sri Indrajothi Road, Ratmalana.	Batiks
4	Mrs M.I. Dharmadasa 49, Station Road Mt. Lavinia.	Batiks
5	Mr P.D. Fernando 292, Telawala Mt. Lavinia.	Batiks
6	Mrs. S.T. Gunasekera 11/1A, Palmgrove Avenue Ratmalana.	Batiks
7	Lathika Batiks 18 2nd Lane, Ratmalana.	Batiks
8	Mrs. I.G. Panditharatne 73 Templer Road, Mt. Lavinia.	Batiks
9.	Mr. V. Senadheera Ceylon Batiks 10th Lane, Ratmalana.	Batiks
10.	S Sithambaram 60 Huludagoda Road, Mt. Lavinia.	Batiks
11	Rekit & Colman (Cey.,) Limited Borupana Ferry Road, Ratmalana.	
12	Maliban Biscuits Manufacturers Limited 389 Galle Road, Ratmalana.	Biscuits
13	Maxims Limited 15 Attidiya Road, Ratmalana.	Brassiers
14	Sri Ramya Industries 3 Old Airport Road, Ratmalana.	Children's Garments
15	Sri Ramya Leela Garments 3 Old Airport Road, Ratmalana.	Children's Garments

	Name & Address	Product
16.	Pooran Industries Limited 36/64 Hindu College Square, 1st Cross Street, Ratmalana.	Buttons
17.	G H N K Dharmadasa 49 Station Road, Mt. Lavinia.	Chalk
18.	Wimaladharma Brothers 7 Old Air Road, Ratmalana.	Clocks, Alarm Clocks
19.	Amico Industries 75/1 2nd Lane, Ratmalana.	Glasers & Stoppers for bottles
20.	Casi Industries 41 Maligawa Road, Ratmalana.	Clothing - children's garments
21.	Raleigh Shirts Industries 421 B Galle Road, Ratmalana.	Clothing - children's garments
22.	W Ganegoda 93 Ananda Mawatha, Colombo 10 Factory - Ratmalana.	Clothing - children's garments
23.	Asha Industries 54/1 Chakkindarama Road, Ratmalana.	Clothing - children's garments
24.	Mangrum Garments Limited 110 Main Street, Colombo 11 Factory - Ratmalana.	
25.	S Sithambaram Huludagoda Road, Ratmalana.	Made up Garments
26.	Mr G I C Fernando 8/7 Palmgrove Avenue, Ratmalana.	Coir Products
27.	Amico Industries (Ceylon) Limited 75 12th Lane, Ratmalana.	Collapsible Tubes Tin Containers
28.	Uswatte Confectionary Works 437 Galle Road, Ratmalana.	Confectionary
29.	Blow-O-Matic Company 54 Attidiya Road, Ratmalana. Office - 17 2/3 Chartered Bank Bldg., Colombo 1.	Plastic Containers Plastic Cane, Plastic Toys
30.	M J Carvallio Plastex Limited 2D Attidiya Road, Ratmalana Office - 9 Shrubbery Gardens Colombo 4.	Plastic Containers, Ball Point Pens, Fountain Pens, and Parts thereof, Plastic Cane, Plastic Toys
31.	Mouldex Limited 5A Attidiya Road, Ratmalana Office - 17-2/3 Chartered Bank Bldg., Colombo 1.	Plastic Containers, Envelopes, Plastic Goods from Plastic Powder, Plastic Toys.

	Name & Address	Products
32.	Ceylon Metal Industries Limited 5A Attidiya Road, Ratmalana. Office - 17-2/3 Chartered Bank Bldg., Colombo 1.	Tin Containers, Stainless steel Ware
33.	Palicrafts 5 A Attidiya Road, Ratmalana. Office - 17/2/3 Chartered Bank Bldg., Colombo 1.	Plastic Containers, Plastic Goods from sheets and sheetings, Plastic Toys.
34.	Daniel & Company Limited 1st Lane, Off Kandawala Avenue Ratmalana.	Corrugated Paper, Corrugated Cardboard Boxes, Corrugated Cardboard Cartons.
35.	Mouldex Limited 5A Attidiya Road, Ratmalana Office - 17/2/3 Chartered Bank Bldg., Colombo 1.	Corrugated Paper, Cardboard Boxes and Cardboard Cartons
36.	Multipacks Ceylon Limited 24 Katukurunduwatta Road, Ratmalana.	Corrugated Paper, Cardboard Boxes and Cardboard Cartons.
37.	Verna Limited 15 Airport Road, Ratmalana.	Corrugated Paper, Cardboard Boxes and Cardboard Cartons.
38.	Maharaja Organization Limited Borupana Ferry Road, Ratmalana Office - 54 Bankshall Street, Colombo 11.	Cosmetics
39.	K Methiyas 5 Thalgahawatta, Attidiya, Dehiwela.	Coffee Powder, Chillie Powder, Curry Powder.
40.	Rekit & Coleman (Ceylon) Limited Borupana Road, Ratmalana.	Disinfectant
41.	Ilty's Products Ilty Hewasy Liyanage 531 Galle Road, Mt. Lavinia.	Distemper
42.	Cement Paints (Ceylon) Limited 25 Lilie Street, Colombo 2. Factory - 11/1 Udaya Mawatha, Ratmalana.	Distemper
43.	M J Carvallie Platex Limited 2D Attidiya Road, Ratmalana.	Drinking Straws
44.	Berec Ceylon Limited 19 Gangedera Mawatha, Off Attidiya Road, Ratmalana. Office - 481 Darley Road, Colombo 10.	Batteries - Dry Cells
45.	Mercury Battery Company 17-2/3 Chartered Bank Bldg., Colombo 1. Factory - Attidiya Road, Ratmalana.	Batteries - Dry Cells
46.	Browns Group Industries Limited 481 Darley Road, Colombo 10. Factory - 33 Katukurunduwatta Mawatha Off Attidiya Road, Ratmalana.	Electric Fans, Machinery - other, Radiators, Tractors, and Trailers, Agriculture.

	Name & Address	Products
47.	Deekay Electronic Industries Limited 26 Keyzer Street, Colombo 11 Factory - Postmasters Place, Off Templers Road, Mt. Lavinia.	Electric Fans, Gas Cookers, Radio Receivers.
48.	Usha Industries Limited 63 Attidiya Road, Ratmalana.	Electric Fans
49.	Avican Products 56 Borupana Road, Ratmalana.	Electric Lighting Fittings
50.	Luxlite Roche Limited 54 Bankshall Street, Colombo 11 Factory - Telawala Road, Katubedda.	Electric Lighting Fittings
51.	Illukkumbura & Sons 486 Sri Sangaraja Mawatha, Colombo 10 Factory - 427 Galle Road, Ratmalana.	Electric Lighting Fittings
52.	Gunaratna Industries 465 Kandawala Mawatha 94 Old Airport Road, Ratmalana.	Electrical Products n.e.s.
53.	Latsha Industries 9/4 Old Airport Road, Ratmalana.	Envelopes
54.	Chemanex Limited Galle Road, Colombo 03. Factory - Ratmalana.	Essential Oils, Rubber goods n.e.s., Sizing Agents for Polyester Blended Yarn.
55.	Deejay Industries 31 Templer Road, Mt. Lavinia.	Fibre Board Suitcases
56.	Island Sea Food 94 1/4 York Street, Colombo 1. Factory - Kandawala Avenue, Ratmalana.	Fish Canning, Preserving of Fish and other Sea Foods.
57.	Amalgamated Industries 12 Y M B A Building, Colombo 1. Factory - Ratmalana.	Fishing Nets
58.	Bata Shoe Company of Ceylon Limited Airport Road, Ratmalana.	Footwear
59.	Sri Lanka Trades & Industries 29 Templer Road, Mt. Lavinia.	Fruit Cordials, Juices and Syrups
60.	Allied Industries Limited 3rd Floor, Chartered Bank Building 7/5, 2nd Lane, Off Templer Road, Mt. Lavinia.	Gas Cookers, Razors
61.	Ceylon Glass Company Limited 3rd Floor, State Bank Building Bailie Street, Colombo 01 Factory - Sri Sangabo Mawatha, Off Borupana Road, Ratmalana.	Glass Bottles & Containers
62.	Benette Industries W M Piyadasa 112 Sea Beach Road, Ratmalana.	Hair Wigs

	Name & Address	Products
63.	Ceylon Metal Industries Limited 17-2/3 Chartered Bank Building Colombo 1. Factory - 5A Attidiya Road, Ratmalana.	Aluminium Hollow Ware
64.	Woodlands Icecream Company 63 Kandawala Mawatha, Ratmalana.	Ice Cream
65.	Polychrome Inks 126 Templer Road, Mt. Lavinia.	Ink
66.	G I Smeets Ceylon Limited 9/4 Aerodrome Road, Ratmalana.	Galvanising
67.	Kuruneru Industries 27/3 Hotel Road, Mt. Lavinia.	Jess Sticks
68.	Sithara Limited 15 Aerodrome Road, Ratmalana.	Ink
69.	Rukmal Industries Attidiya Road, Dehiwela.	Jess Sticks
70.	T Senathilverl 31 Samudrasanna Road, Mt. Lavinia.	Jess Sticks
71.	Macklisters Block No. 42 2nd Land, Kandawala Kandawala Estate, Ratmalana.	Knitting Needles
72.	Rajapaksa Industries 38 Upper Chatham Street, Colombo 1 Factory - 30 Udaya Mawatha, Off Templer Road, Mt. Lavinia.	Optical Lenses. Optical Frames
73.	Calanso Investments Limited 179 Galle Road, Ratmalana.	Locks
74.	Colombo Cereal Food Products 23 Norris Avenue, Colombo 8 Factory - 63 Udaya Mawatha Off Templer Road, Mt. Lavinia.	Macaroni & Noodles
75.	Wimaladharma Brothers 120 Front Street, Colombo 11 Factory - 7 Old Airport Road, Ratmalana.	Mathematics Instruments, Watches and Clocks
76.	Electro Refrigeration Centre 11 Terrance Avenue, Mt. Lavinia.	Metal Products
77.	Leatherette (Ceylon) Limited 7/4 2nd Lane, Off Templer Road, Mt. Lavinia.	Microcellular Sheets, Rubber Compound, Rubber Goods, n.e.s., Rubber Sheetings.
78.	Paints & General Industries Maligawa Road, Ratmalana.	Vegetable Oils, Oils & Fats, Vegetable and Animal.

	Name & Address	Products
79.	Tilaka Abeysekara 11/4 St. Mary's Road, Mt. Lavinia.	Ornamental Statues
80.	Hemalatha Kulaweera 41 Sri Dhammadura Mawatha, Ratmalana.	Ornamental Statues
81.	Maharajah Organization Limited 54 Bankshall Street, Colombo 11 Factory - Borupana Ferry Road, Ratmalana.	Pharmaceuticals, Plastic - pipes, PVC compound, Telcum Powder.
82.	Pioneer Pharmacy 183 Main Street, Colombo 11 Factory - 18 5th Lane, Off Galle Road, Ratmalana.	Pharmaceuticals, Toothpaste/ Tooth Powder.
83.	Reckitt & Coleman (Ceylon) Limited Borupana Ferry Road, Ratmalana.	Pharmaceuticals, Scouring Powder, Telcum Powder.
84.	Sri Lanka Rasayanagaraya 234 Galle Road, Mt. Lavinia.	Pharmaceuticals
85.	Allied Industries Limited 3rd Floor, Chartered Bank Bldg., Colombo 1. Factory - Kandawala Mawatha, Off Attidiya Road, Ratmaland.	Pins and Clips - Hair
86.	Walker & Greig Limited 338 Darley Road, Colombo 10 Factory - 33 Katukurunduwatte Mawatha Off Attidiya Road, Ratmalana.	Plastic Cane, Plastic Goods from Plastic Sheets and
87.	Avican Products 56 Borupana Road, Ratmalana.	Plastic Goods from Sheets and Sheetings.
88.	Hewawitharana Industries 412A Galle Road, Ratmalana.	Plastic Goods from Sheets and Sheetings.
89.	Industrial Packaging Company C/o. Bhatt Services Limited 17-2/3 Chartered Bank Building Colombo 1. Factory - 70 Attidiya Road, Ratmalana.	Polythene Films and Bags
90.	Varna Limited 15 Aerodrome Road, Ratmalana.	Polythene Films and Bags
91.	W A Vimaladharma & Company Limited 171 Main Street, Colombo 11 Factory - 7 Old Airport Road, Ratmalana.	Radio Receivers, Razors
92.	Maxim Limited 15 Attidiya Road, Ratmalana.	Sanitary Towels, Shirts, Slacks.
93.	Mareena Kumarasinghe 477 Galle Road, Mt. Lavinia.	Sauces, Chutneys and Pickles

	Name & Address	Products
94.	Collin & Brooks 124 First Cross Street, Colombo 11 Factory - 21/20A Sri Dharmapala Road, Mt. Lavinia.	Sauces, Chutneys & Pickles
95.	Singer Industries Ceylon Limited 435 Galle Road, Ratmalana.	Sewing Machines
96.	Sri Ramya Industries Limited 3 Old Airport Road, Ratmalana.	Sewing Machines
97.	Usa Industries Limited 68 Attidiya Road, Ratmalana.	Sewing Machines
98.	Ceylon Dia Shirts Company Limited 1 Union Place, Colombo 2. Factory - Attidiya Road, Ratmalana.	Shirts
99.	Cupid Industries 25 AttidiyaRoad, Ratmalana.	Shirts
100.	Hentley Garments Limited 10 Airport Road, Ratmalana.	Shirts
101.	W Ganegoda 93 Ananda Mawatha, Colombo 10. Factory - Ratmalana.	Shirts
102.	Magnum Garments Limited 110 Main Street, Colombo 11 Factory - Ratmalana.	Shirts
103.	Raleigh Shirts Industries 421B Galle Road, Ratmalana.	Shirts
104.	Sri Ramya Industries 3 Old Airport Road, Ratmalana.	Shirts, Umbrellas
105.	Sri Ramya Leela Garments 3 Old Airport Road, Ratmalana.	Shirts
106.	United Garments International 8 Old Airport Road, Ratmalana.	Shirts
107.	Victor Hettigoda Hettigoda Industries 25 2nd Lane, Ratmalana.	Slates
108.	B P Weerasinghe 19 Raja Mawatha, Ratmalana.	Slates
109.	Lanka Chemical Industries Mrs N A Perera 106 Main Road, Attidiya, Ratmalana.	Slates
110.	Latsha Industries 9/4 Old Airport Road, Ratmalana.	Staples, Wire Nails

	Name & Address	Products
111.	Ceylon Services and Supplies Co Ltd. 29 Attidiya Road, Ratmalana.	Wooden Tableware
112.	Meetiyagoda Weaving Mills 64 Maligawa Road, Ratmalana.	Textile Machinery and Spares
113.	Devika Textile Printing Industries 61/1 Kandawala Mawatha, Ratmalana.	Textile Printing
114.	Mrs H L C Gunawardena 40 Station Road, Mt. Lavinia.	Textile Printing
115.	Indra Textile Printing Industries 3 Old Airport Road, Ratmalana.	Textile Printing
116.	Lalitex Industries 13 Iddamal Mawatha, Sirimal Uyana Ratmalana.	Textile Printing
117.	Kundanmals Industries Limited 26 Keyzer Street, Colombo 11.	Textile Printing
118.	Manipuri Industries Limited 493 Galle Road, Colombo 3. Factory - 3A Attidiya Road, Ratmalana.	Textile Printing, Weaving and Finishing of Silks and Synthetic Textile.
119.	Pathira Textile Printing Industry 353, Galle Road, Ratmalana. Factory - 288 Main Road, Attidiya, Dehiwela.	Textile Printing
120.	Weeraman Industries 101 De Alwis Road, Mt. Lavinia.	
121.	Asian Cotton Mills Limited 7 De Soysa Avenue, Templers Road, Mt. Lavinia.	Spinning, Weaving and Finishing of Cotton Textiles.
122.	Paragon (Textile) Industries Limited 118 Main Street, Colombo 11 Factory - 47 - 49 Old Airport Road Ratmalana.	Textile - Weaving and Finishing - Silks and Synthetics.
123.	Chemway (Ceylon) Limited 54 Bankshall Street, Colombo 11 Factory - Borupana Ferry Road, Ratmalana.	Tooth paste/Tooth powder.
124.	Chulan Mechanical Outfits 11 Terrance Avenue, Mt. Lavinia.	Toys - metal
125.	H Percy, Chandana Pharmacy 283 Galle Road, Mt. Lavinia.	Twine
126.	B Abeysekera 136 Kandawala Road, Ratmalana.	Varnishes, and Polishes
127.	Devonshire Industries 407 Kandawala Mawatha, Ratmalana.	Varnishes and Polishes

	Name & Address	Products
128.	Redlex Products 30 Beach Road, Mt. Lavinia.	Polishes
129.	D K Kulaweera 21 Dharmadara Mawatha, Ratmalana.	Water Colours
130.	Gunaratna Industries 465 Kandawala Mawatha, Ratmalana.	Welding Electrodes, Welding Transformers.
131	Ceylon Service & Supplies Co. Ltd., 29 Attidiya Road, Ratmalana.	Wood Products n.e.s.
132.	Fleet Fastners Ceylon Limited 106 Main Street, Colombo 11 Factory - 419/1 First Lane Ratmalana.	Zip Fasteners

ANNEXURE I(B)

APPROVED INDUSTRIES IN MORATUWA (Electorate No. 28)

	NAME & ADDRESS	PRODUCTS
1.	Velona Industries De Mel Road Velona Moratuwa.	Aerated Waters
2.	Dental & Pharmaceutical Industries 54, St. Peters Road Moratuwa. OFFICE - 20-1/2, Bogala Building Queen Street, Col.1.	Artificial Teeth
3.	Lankalight Knitting Co. 63, Koralawella, Moratuwa.	Bannians & T Shirts
4.	Lanka Weaving Mills Ltd. De Mel Road, Velona Moratuwa.	Bannians & T. Shirts Carpets & Rugs, Labels Ribbons & Tapes, Shirts Socks, Filing Tags, Shoe Laces, Textile Printing, Textile Products - other Textile Spinning & Weaving & finishing.
5.	Supreme Knitting Co. 97, Digarolla, Moratuwa.	Bannians & T'Shirts
6.	M.K.B. de Silva 46/5, Lady de Soysa Drive Moratuwa.	- do -
7.	P.K.D. Dharmasena 70, Mihiri Pedesa Asiri Uyana, Moratuwa.	- do -
8.	Lanka Jathika Sarvodaya Sangamaya 77, De Soysa Road, Moratuwa.	- do -
9.	Sydney T.E. Mendis 11/10, Dharmaratna Mawatha Rawatawatte, Moratuwa.	Batiks
10.	M.J. Dias Boat Yarde 578, Metikanda Road, Ratmalana, Moratuwa.	Boats
11.	Katukurunda M.P.C.S. Katukurunda, Moratuwa.	Made up Garments
12.	Dona Sumana Lokuketagoda 79/1, Koralawella, Moratuwa.	- do -
13.	Rawatawatta M.P.C.S. Rawatawatta, Moratuwa.	- do -

	NAME & ADDRESS	PRODUCTS
14.	Board & Paper Industries 92, Willorawatta Road, Moratuwa.	Corrugated Paper Corrugated cardboard boxes Corrugated cardboard cartons
15.	Seimon Brothers 234, 5th Cross Street, Old Town Market, Col. 11. Factory : 11, Molpe Lane, Moratuwa.	Cosmetics Pharmaceuticals
16.	Wije Metal Industrialists M.A. Wijehamy, 163, Bandaranaike Mawatha, Katubedda, Moratuwa.	Cruciables
17.	Gim Products Ltd. 122, Keyzer Street, Colombo 11. Factory - 721, Galle Road, Moratuwa.	Educational Equipments Plastic, Plastic Cane Wooden Toys
18.	Miltons 84, First Cross Street, Colombo 11. Factory - Moratuwa.	Electrical Products n.e.s.
19.	Chamanex Ltd. Galle Road, Colombo 3. Factory - Telawala Road, Ratmalana.	Adhesives & Glue
20.	Chemical Industries (Colombo) Ltd. Ratmalana Works Talawala Road - Ratmalana Head Office - Hemas Building Colombo 1.	Agricultural Chemicals Plastic Pipes P.V.A. Products Polythene Films & Bags.
21.	Ceylon Button Industries 5, Lady Catherene Estate Model Town Ratmalana.	Buttons
22.	W.A. de Silva & Co. 46, Front Street, Colombo 1. Factory - 129, Sri Rahula Mawatha, Talawala, Ratmalana.	Alarm Clocks
23.	Indian Humo Pipes Co. Ltd. Lady Catherene Estate, Ratmalana.	Concrete Pipes
24.	Ceylon Paint Industries Ltd. Lady Catherene Drive, Ratmalana.	Distemper

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	NAME & ADDRESS	PRODUCTS
25.	Glaxo Allenburys (Ceylon) Ltd. Hongkong & Shanghai Bank Building, Colombo 1. Factory - Galle Road, Ratmalana.	Glucose Dried Milk Packing Pharamaceuticals.
26.	Pfizer Ltd. 688, Galle Road, Ratmalana.	Pharmaceuticals
27.	Lanka Metal Works 180, Prince Street, Colombo 11. Factory - 674/1, Maligawa Road, Moratuwa.	Aluminium Hollow-ware
28.	U.L.M. Silva 402, Galle Road, Rawatawatte, Moratuwa.	Household Brass Fittings
29.	Lanka Light Ltd. 81, Koralawella, Moratuwa.	Matches
30.	Ceylon Paint Industries Ltd., Lady Catherene Road, Ratmalana.	Paints, Varnishes & Lacquers
31.	Board & Paper Industries 12, Willorawatte Road, Moratuwa.	Paper Bags.
32.	Hirani Industrial Works 180, Prince Street, Col. 11. Factory - 674/1, Maligawa Road, Moratuwa.	Ball Point Pens Plastin cane, Plastic containers, Plastic Toys, Vaccum Flasks.
33.	Unical Ceylon Ltd. 47, Flower Road, Col.3. Factory - Lady Catherene Estate, Ratmalana.	Pharmaceuticals
34.	Ceylon Polythene Industries, 550/10, P.B. Alwis Perera, Katubedda, Moratuwa.	Polythene Films & Bags
35.	Favourite Industries Ltd. 128, Keyzer Street, Colombo 11. Factory - 721, Galle Road, Moratuwa.	Radio Receivers Textile - spinning, weaving & finishing - Silk & Synthetics.
36.	Radio Development Organization 215/51, Gaswork Street, Colombo 11. Factory - Lady Catherene Drive, Ratmalana.	Radio Receivers
37.	Steuart Industries Ltd. 670, Galle Road, Ratmalana.	Sewing Machines
38.	Cupid Tours Ltd., 460, Rawatawatte, Moratuwa.	Shirts

	NAME & ADDRESS	PRODUCTS
39.	Comforts Coil Springs Manufacturing Co. 22/1, Church Road, Rawatawatte, Moratuwa.	Springs & Spring Beds
40.	Maurice Roche Ltd. 54, Bankshall Street, Colombo 11. Factory : Talawala Road, Katubedda, Moratuwa.	Re-inforced concrete products Talcum Powder.
41.	Dodanduwa Weaving Mills 107, Model Town, Ratmalana.	Textile Printing
42.	Mrs. Jayasinghe Malsara Industries, 11/13, Uyana 1st Lane, Moratuwa.	Textile Printing
43.	Ajantha Textile Industries Ltd. 86, Lady Catherene Estate, Ratmalana.	Textile-Weaving & Finishing Silks & Synthetics
44.	Hudsons Textile Industries Ltd. Bankshall Street, Col. 11. Factory - Lady Catherene Estate, Ratmalana.	-- do --
45.	Velona Silks Ltd. De Mel Road, Velona, Moratuwa.	- do -
46.	Visaka Textile Industries Ltd. Lady Catherene Estate, Ratmalana.	- do -
47.	Area Rubber Products M.C. Mendis, 24/1, Lady De Zoysa Drive, Uyana, Moratuwa.	Rubber Toys
48.	Maharaja Organization Ltd. 54, Bankshall Street, Col. 1. Factory - Talawala Road, Katubedda.	Wire Nails
49.	Sri Lanka Plywood Corp. Carpentry Workshop, Velona, Moratuwa.	Wood Products n.e.s.
50.	Williamson Industries, 128, Koralawella, Moratuwa.	- do -
51.	Manel Furnishing House 408, Moratumulla, Moratuwa.	Wood Products n.e.s.
52.	W.M.de Mel Digarolla, Moratuwa.	Socks
53.	Warwick Motors, 28, Angulana Junction, Moratuwa.	Motor Spares
54.	Ceylon Galvanising Industries Lady Catherene Estate, Ratmalana.	Galvanizing - Iron & Steel

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MAJOR POLLUTING INDUSTRIES IN THE MORATUWA AND RATMALANA AREAS

	ANNEXURE 1 (A)	ANNEXURE 1 (B)
1.	Associated Battery Manufacturers (Ceylon) Ltd. Katukurunduwatta Mawatha, Off Attidiya Road, Ratmalana. Office - 481, Darley Rd., Col.10.	Velona Industries De Mel Road, Velona, Moratuwa.
2.	Asbestos Cement Industries Ltd. Katukurunduwatta, Off Attidiya Rd., Ratmalana. Office - 175, Armour Street, Colombo 12.	Lanka Weaving Mills Ltd., 63, Koralawella, Moratuwa.
3.	Amico Industries 75/1, 2nd Lane, Ratmalana.	Board & Paper Industries 92, Willorawatta Rd., Moratuwa.
4.	Uswatte Confectionary Works 437, Galle Road, Ratmalana.	Chemanex Ltd., Galle Road, Colombo 3. Factory - Telwala Road, Ratmalana.
5.	Blow-O-Matic Company 5A, Attidiya Road, Ratmalana. Office - 17-2/3, Chartered Bank Bldg. Colombo 1.	Chemical Industries (Colombo) Ltd. Ratmalana Works, Telawala Rd.,Ratmalana. Head Office - Hemas Building, Col. 1.
6.	M.J. Carvallio Plastex Ltd. 2D, Attidiya Rd., Ratmalana. Office - 9, Shrubbery Gardens, Colombo 4.	Indian Humo Pipes Co. Ltd. Lady Catherene Estate, Ratmalana.
7.	Mouldex Ltd. 5A, Attidiya Road, Ratmalana. Office - 17-2/3, Chartered Bank Bldg., Col.1.	Ceylon Paint Industries Ltd., Lady Catherene Drive, Ratmalana.
8.	Ceylon Metal Industries Ltd., 5A, Attidiya Road, Ratmalana. Office - 17-2/3, Chartered Bank Bldg., Colombo 1.	Glazo Allenburys (Ceylon) Ltd., Hongkong & Shanghai Bank Building, Colombo 1. Factory - Galle Road, Ratmalana
9.	Palicraft 5A, Attidiya Rd.,Ratmalana Office - 17-2/3, Chartered Bank Bldg., Colombo 1.	Pfizer Ltd.., 688, Galle Road, Ratmalana.
10.	Multipacks Ceylon Ltd. 24, Katukurunduwatta Road, Ratmalana.	Dodanduwa Weaving Mills 107, Model Town, Ratmalana.
11.	Verna Ltd. 15, Airport Road, Ratmalana.	Mrs. M. Jayasinghe Malsara Industries 11/13, Uyana 1st Lane, Moratuwa.

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ANNEXURE 1(A)	ANNEXURE 1(B)
12. Maharaja Organization Ltd. Borupana Ferry Rd., Ratmalana.	Ajantha Textile Industries, 8C, Lady Catherene Estate, Ratmalana.
13. Berec Ceylon Ltd. 19, Gangedera Mawatha, Off Attidiya Road, Ratmalana. Office - 481, Darley Rd., Col.10.	Baksons Textile Industries Ltd., 49, Bankshall Street, Colombo 11. Factory - Lady Catherene Estate, Ratmalana.
14. Mercury Battery Co. 17-2/3, Chartered Bank Bldg., Colombo 1. Factory - Attidiya Rd., Ratmalana.	Visaka Textile Industries Ltd. Lady Catherene Estate, Ratmalana.
15. Chemanex Ltd., Galle Road, Col.3. Factory - Ratmalana.	Ceylon Galvanising Industries, Lady Catherene Estate, Ratmalana.
16. Bata Shoe Co. of Ceylon Ltd., Airport Road, Ratmalana.	
17. Woodlands Icecream Co., 63, Kandawala Mawatha, Ratmalana.	
18. G.I. Sheets Ceylon Ltd., 126, Templer Rd., Mt. Lavinia.	
19. Devika Textile Printing Industries 61/1, Kandawala Mawatha, Ratmalana.	
20. Indra Textile Printing Industries, 3, Old Airport Rd., Ratmalana.	
21. Lalitex Industries, 13, Iddamal Mawatha, Sirimal Uyana, Ratmalana.	
22. Kundanmals Industries Ltd., 26, Keyzer Street, Col.11.	
23. Manipuri Industries Ltd.,, 493, Galle Rd., Col.3. Factory - 3A, Attidiya Road, Ratmalana.	
24. Pathira Textile Printing Industry, 353, Galle Rd., Ratmalana. Factory - 288, Main Rd., Attidiya, Dehiwala.	
25. Asian Cotton Mills Ltd., 7, De Soysa Avenue, Templer Road, Mt. Lavinia.	
26. Paragon (Textile) Industries Ltd., 118, Main Street, Col. 11. Factory - 27-49, Old Airport Rd., Ratmalana.	

NOTE : - The major pollutants in the area are the Textile Finishing & Dyeing Industries. Among these are small scale Batik Printing Industries, discharging effluents carrying dyes, organic compounds and oil into surface waters.

ANNEXURE 2 (A)

Sheet 1
FORM E-W

GREATER COLOMBO ECONOMIC COMMISSION

WASTE WATER AND SOLID WASTE INVENTORY

Ref. File No:

Code No:

1. Name of Factory:

2. Manufactured Products:

3. Raw Materials Used:

4. Water Consumption:
(present & future)
Source of water:
(attach analysis report of water)

Daily Water Consumption:

Process

Floor Washing

Cooling

Domestic (bath, toilet, kitchens, etc.)

Any other

5. Any recycling of used water envisaged:

State details:

FORM E-W

Code No:

6. Waste Water Discharges (anticipated or measured)
gallons/day.

Total Quantity.
Cooling water.
Process Waste.
Domestic Waste Water.

7. Breakdown of process waste water.

1	11	111	IV	V
Serial No.	Process	Average discharge gallons/day	Maximum discharge gallons/day	Remarks Batch or continuous process etc.
1.				
2.				

8. Type of treatment.
(adopted or proposed)
Give details & flow chart.

9. a) Final disposal of waste water:
(details of conduits, point of discharge to land, river, sewer etc.)

b) Any provision made for sampling and measurement of waste water flow:
State type and location:

10. Composition or characteristics of waste water before treatment.
(From important individual drains and/or combined waste water drain)
(probable or analysed)

a) Physical

Temperature
pH
Colour
Odour
Total suspended solids
Total dissolved solids
Total velatile solids

b) Chemical

Acidity
Alkalinity
Five-day BOD_5 at $20^{\circ}C$
COD
Dissolved Oxygens
Oils & Grease
Ammonia as Nitrogen (free & total)
Chlorides
Sulphides
Sulphates
Cyanides
Phenols
Trace Metals etc.

11. Any specific toxic compounds discharged with waste water specify (organics, inorganics etc)

12. Solid Wastes

Nature and Type:
(organic, inorganic, ash, metal etc.)

Total quantity of solid wastes in Kg. per day:

Method of disposal of solid waste including sludge from waste water treatment.

i. Land-fill - if so where and how
ii. Incineration or borning
iii. Dumping in sea, river etc.
iv. Any other place

13. Cost of waste water treatment and disposal.
Total expenditure for water
Pollution control.
Itemwise and total.
(specify whether it is proposed or already spent).

any other information (separate annexures may be attached if needed)

Signature with
Date:
Name & Designation:

Factory/Institution.

(For GCEC use)

Signature of authorised officer of GCEC with date.

Name:

Designation.

ANNEXURE 2 (B)

SHEET 1

FORM E-A

GREATER COLOMBO ECONOMIC COMMISSION

AIR EMISSION INVENTORY

For Office Use Only :

Ref. File No. :

Code No. :

1. Name of Factory :

2. Boilers and Furnaces Used :

Purposes :

Number :

Capacity :

Fuels, type :

Any Other :

Inside Temp :

3.

Fuel	Fuel Oil	Diesel Oil	Natural Gas	Coal	Wood	Others, Specify
Consumption tonnes/day						
Calorific Value						
Ash Content %						
Sulphur Content %						
Others (Specify)						

* To be evaluated in conjunction with FORM E

FORM : E - A

Code No.

4. Dispersal of Air Pollutants (from combustion processes, furnaces)

Total number of stacks/chimneys :

Height of each :

Internal diameter - at top :

- at bottom :

5. Gases and particulate matter from stacks/chimneys :

Temperature :

Estimated rate of emission of gases and particulate matter :

Probable (or measured) components of exit gas and particulate matter from each stacks/chimneys.

Component	% Concentration by volume	Quantity tonnes/day or kg/day	Estimated or by actual analysis
Sulphurdioxide (SO_2)			
Oxides of Nitrogen (NO_x)			
Carbon monoxide (CO)			
Carbon Dioxide (CO_2)			
Hydrocarbons			
Particulate Matter (Solids)			
Smokiness			
Moisture			
Any Other			

Code No.

6. Emissions from Processes

Mention the anticipated air emissions from different processes :

Height and diameter of the stacks from each process :

Probable (or measured) composition and quantity of emissions from each component :

a) Gases	Quantity tonnes/day	Source	Temp.	Remarks
SO_2				
Oxides of Nitrogen				
CO				
CO_2				
HH_3 (Ammonia)				
Acid Mists				
Hydrocarbons				
Hydrogen Sulphide				
Mercaptan				
Moisture				
Others (Specify)				

b) Particulate matter : (Dust, Solids)

Nature and Composition :

Quantity :

Source :

c) Any odour producing process :

d) Any particular process producing 'noise' (Specify)

Code No.

7. Flare discharge - does it exist ?

if so,

Height :

Nature, quantity of gases burnt :

Any steam or other gases used :

8. Insidious (or unnoticed) escape of air pollutants. State the possible locations in each processes, pipe lines, etc., and nature of pollutants :

9. Any Incinerator used for Burning Solid Wastes, Industrial Waste sludge, etc. Give details :

10. Any open burning (on ground) being done ? If so, give details of materials, quantity, frequency and duration of burning :

11. Ventilation provisions in each shed (or enclosure)

Total open area :

% of openings with reference to area :

Total number of exhaust fans :

Height from ground level :

Capacity of fans :

Probable pollutants within enclosure :

Code No.

FORM : E - A

12. Any local exhaust ventilation provided for any process : Specify :

13. Control of Air Emissions :

Methods of Control :

Number and type of equipment, specifications, data and location (collections, scrubbers, etc) :

Method of handling and disposal of waste products trapped by control equipment :

Any emission standards (being or to be followed); if so, specify :

14. Monitoring :

Any stack or ground level monitoring of air pollutants being or proposed to be done, if so, specify :

Give data (if any) :

Any laboratory facilities for the same in factory. Give details :

Code No.

15. Cost of Pollution Control :

Total expenditure for pollution control : itemwise and total

(Specify whether it is proposed or already spent)

16. Any other relevant information :

(Any relevant information can be given in separate annexures)

Signature with date

Name

Designation

Factory/Institution

Signature of Authorized Officer of GCEC with date :

Name :

Designation :

ANNEXURE 3

A. List of Dangerous and Offensive trades prohibited in all Zones except in Industrial Zones

1. Manufacturing, Curing or Processing of

i. Arecanuts
ii. Blood and Offal
iii. Bricks and tiles
iv. Copra, desiccated coconut, coconut husk and oil using machinery
v. Compost, artificial manure
vi. Fibre
vii. Firworks
viii. Hides and skins
lx. Koda
x. Lime
x1. Matches using machinery
x11. Rubber
x111. Plumbago
xiv. Sago
xv. Tobacco
xv1. Soap
xv11. Vinegar

2. Dyeing of Fibre and Textiles and Tanning of Leather

1.

3. Storing except for Retail Trade of

i. Bones
ii. Coal - Charcoal
iii. Compost or artificial manure
iv. Copra
v. Cotton wool
vi. Fibre
vii. Fish
viii. Petroleum
ix. Raw Hides
x. Straw
xii. Wood

B. List of Dangerous and Offensive trades prohibited in all Zones except in the Agricultural Zone.

1. Quarrying for Cabook, Gravel, Metal and Mining

ANNEXURE 4

GREATER COLOMBO ECONOMIC COMMISSION

Tolerance Limits for Industrial Waste Water Discharged into Inland Surface water

	PARAMETERS	VALUES (NOT TO EXCEED)
1.	BOD in 5 days at 20°C	30
2.	ph	between o and 8.5
3.	Suspended solids mg/1	50
4.	Temperature oC	40
5.	Oil and grease mg.1	10
6.	Phenolic compounds mg/1	1.0
7.	Cyanides mg/1	0.2
8.	Sulphides mg/1	2.0
9.	Flourides mg/1	2.0
10.	Total residual chlorine mg/1	1.0
11	Arsenic mg/1	0.2
12	Cadmium mg/1	0.1
13.	Chromium mg/1	0.1
14.	Copper mg/1	3.0
15.1	Lead mg/1	0.1
16.	Mercury mg/1	0.0005
17.	Nickel mg/1	3.0
18.	Selenium mg/1	0.05
19.	Zinc mg/1	5.0
20.	Amoniacal Nitrogen mg/1	50.0
21.	Boron mg/1	-
22.	Percent Sodium	-
23.	Sulphates as SO_4 mg/1	-
24.	Pesticided	
	a) Organo-phosphorous cpds	0
	b) Chlorinated Hydrocarbons (as cl) mg/1	0
25.	Radioactire materials	
	a) Alpha emitters, Uc/ml	10^{-7}
	b) Beta emitters, UC/ml	10^{-6}
26.	Colour and Odour	Colour -50 (Platinum /Cobalt Scale) Odour - no Unpleasant odour

GREATER COLOMBO ECONOMIC COMMISSION

Suggested Tolerance Limits for Industrial Waste Waters Discharged into Public (Common) Sewer

PARAMETERS	VALUES (NOT TO EXCEED)
BOD in 5 days at 20°C mg/1	200
pH	between 6 and 8.5
Suspended solids, mg/I	500
Total Dissolved solids, mg/I (inorganic)	2,100
Temperature °C	40
Phenolic compounds, mg/I (as CH_4CH)	10 (Subject to secondary treatment)
Oil and grease, mg/I	30
Cyanides, mg/I	2
Chromium (Hexavalent) mg/I	2
Copper, mg/I	3
Lead, mg/I	1
Nickel, mg/I	2
Zinc, mg/I	10
Boron, mg/I	2
Precent Sodium	60 (for irrigation purpose only)
Ammoniacal Nitrogen, mg/l (as N)	50
Alpha emitters, Uc/ml	10^{-7}
Bota emitters, Uc/ml	10^{-6}
Sulphates as SO4 (mg/I)	1000
Chlorides (as (cl) mg/I)	900
Colour (Platinum cobolt scale)	50

Please note: Adopted from Indian Standards (IS: 3306 - 1974) with certain modifications

mg/I = milligrams/litre: Uc/ml = microcuries/millilitre

BOD = Biochemical oxygen demand

The quality of waste waters discharged into common sewer or collection system should be such as to ensure that the waste water

i) does not damage the sewer by physical or chemical action.

ii) does not endanger the health of the workers cleaning the water.

iii) does not upset the processes that are normally used in sewage treatment.

iv) does not overload the common treatment plant

v) does not damage the crops or affect the soil in case the effluent after treatment is used for irrigation and

vi) does not create fire and explosion hazards due to certain constituents presents in the effluent.

VIII

GREATER COLOMBO ECONOMIC COMMISSION

New Source Air Emission Norms

(Tentative)

Source	Emission
Fossil fuel fired steam generator	
Particulate Matter.	0.5 to 0.7/10^6 BTU heat input
Sulphurdioxide	1.6 to 2.0/10^6 BTU.
Visible emissions	Not to exceed 20 percent capacity (occasionally up to 40 percent for 2 minutes)
Any Source	
Smoke	Not to discharge smoke of a shade as dark or darker than No.2 of the Ringleman Chart. It may be exceeded for a short period (5 to 10 minutes) during start up or shut down.
Sulphuric Acid Plant	
Sulphurdioxide	4 lbs of SO_2 per ton of 100 percent Sulphuric Acid. 0.2 lbs of Sulphuric Acid per ton of 100% acid produced.

IX

GREATER COLOMBO ECONOMIC COMMISSION

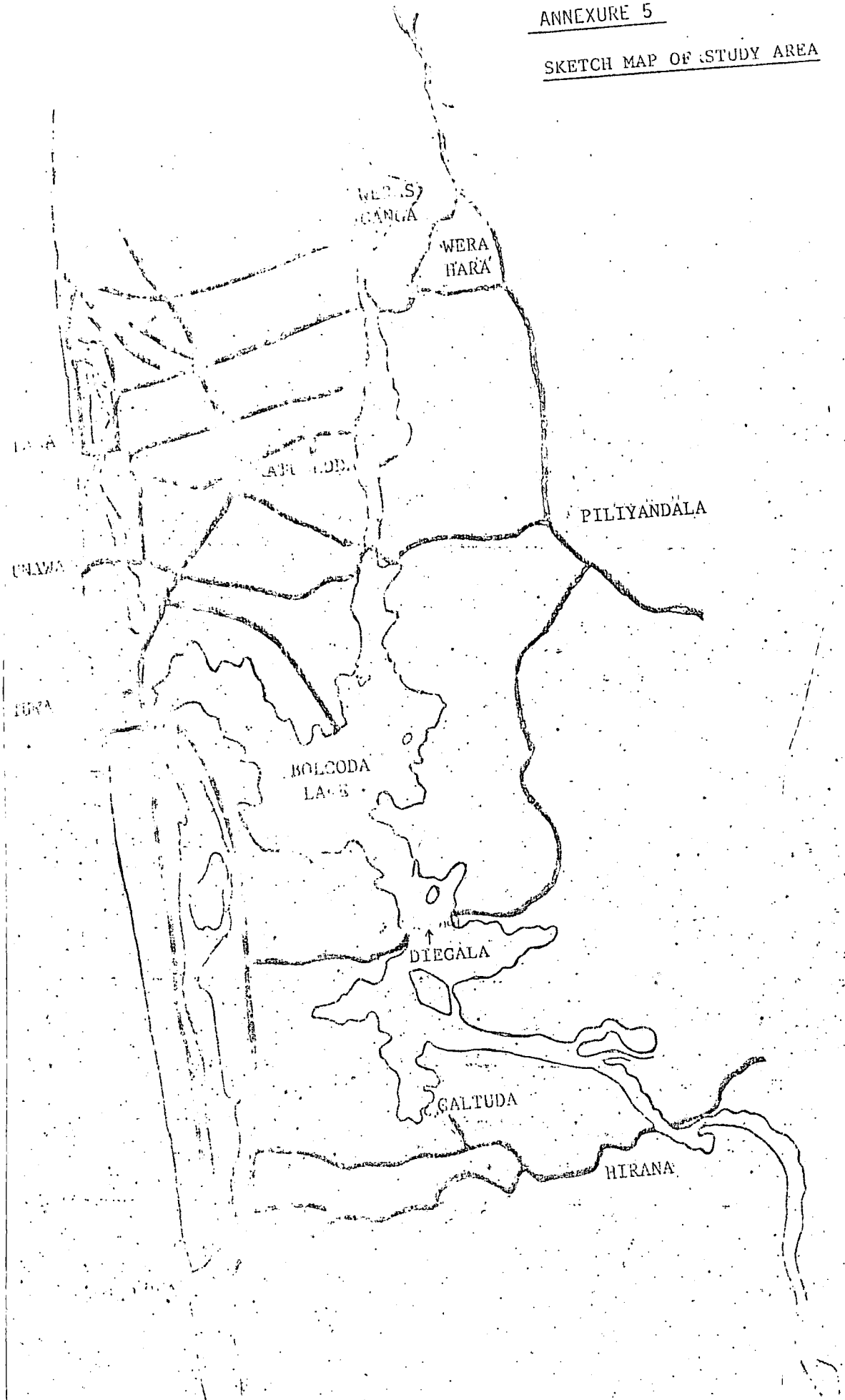
Typical Noise Level Criteria *

Area	Sound Level (dBA)		
	Day	Night	Other times
Rural (residential)	50	40	45
Suburban (residential) hospital, places of worship etc.	55	45	50
Urban (residential)	60	50	55
Urban (residential) with some commercial, retail or light industry)	63	55	60
Predominantly industrial	70	60	65
Heavy Industrial few dwellings	75	65	70

* Ref. American Petroleum Institute 'Guidelines on Noise' Medical Research Report.

ANNEXURE 5

SKETCH MAP OF STUDY AREA



ANNEXURE 6

FORM E

GREATER COLOMBO ECONOMIC COMMISSION
INDUSTRIAL EMISSION QUESTIONNAIRE

For Office Use

Code No.

Ref.:

Date :

1. Name of the Factory/Institution :

2. Location :

3. Factory Layout Plan :

Occupied area :

Total area:

4. Name and Address of Applicant :

Phone No. :

5. Contact officials/s for questionnaire :

Names and Designations:

Addresses :

6. Date of commencement of operation :

Any phased programme (Details)

FORM E

7. List of Manufactured Main Products :

Present design and future capacities :

8. List of by-products and capacities :

9. Processes used - brief description :
(attach process flow diagram)

Batch or continuous processes ?

10. Raw materials used (including catalysts additives) and process chemicals used :

11. Physical and chemical characteristics of raw materials :

12. Water - quantity asked for/or consumed :

State requirements/consumption for

i. Domestic :

ii. Cooling :

iii. Process :

iv. Any other use :

13. Any cycling of waste water or cooling water done :
Specify

FORM E

14. Total Energy Consumption :

Inplant generation :

Type of generation :

Public Supply :

15. Nature of fuels used :

Purposes :

Daily Consumption :

16. Any recycling of waste material (from own or other industry) used in the processes :

17. Possible salvage of any waste material for use : Specify :

18. Number of Shifts worked for each process :

Number of Workers in each shift :

19. If Industry is not within IPZ, List of existing or proposed industries/institutions nearby (within 2 Kms) :

20. If industry is not within IPZ, Nature of area within 2 Kms of Industry :

(Agriculture, human settlement, vegetations, barren etc.) :

Note : Any relevant information can be given in separate annexures

Signature with date :

Name :

Designation :

Company:

Received on :

Signature of Official of GCEC:

Annex VII

A SURVEY OF THE INDUSTRIAL POLLUTION IN THE MORATUWA AREA

Report I 13/5/1981.

1. Introduction:

It has been brought to the notice of the CISIR by Mr. Tyronne Fernando, M.P. (Moratuwa) that industrial pollution in the Moratuwa area has risen to such enormous proportions that public disquiet is growing. At a number of meetings held in Moratuwa with the industrialists, CISIR officers and officers of the Occupational Health Division of the Labour Department, Mr. Fernando emphasised the immediate necessity to carry out a survey of the extent of industrial pollution in the area and to take necessary steps for the abatement of the same. In this connection at the meeting held on the 24th of February 1981, the CISIR (represented by Dr. P.M. Jayatissa, Head Industrial Microbiology, Mr. I.G. Premaratne and Mr. D.J. Abeyratne) undertook to carry out a preliminary survey to identify the major pollution causing industries and to recommend methods to minimize the pollution caused by these industries.

Subsequently two visits were made by CISIR officers to a number of industries, mainly textile and chemical industries, to identify the types of wastes (both liquid & solid) and their quantities, and methods (if any) adopted by the management of the respective industries for tretment and disposal of these wastes. The information collected during these visits, preliminary data on the effluents and recommendations for future action are given below in this report.

2. Information collected from Industries visited by CISIR

a) Chemical Industries (Colombo) Ltd,
Telawala Road,
Ratmalana.

Products and processes of the factory:

Production of poly vinyl acetate, Agrochemicals and extruded polythene.

Effluent and waste products

Source	Quantity/day	Quality	Treatment and disposal
1) P.V.A. Plant	250 gal	Wash water (milky white)containing Vinyl acetate, PVA etc. COD - 1534 mg/1 pH - 6.6 TS - 2130 mg/1	Physico-chemical treatment for precipitation, and filtration through sand bed. Disposed into public drain
2) Agrochemicals Plant	50 gal	wash water containing agro-chemical residues	filtration through sand bed disposed into public drain.
3) Pipe extrusion Plant	nil	-	-

b) Chemanex Ltd;
No. 6, Telawala Road,
Ratmalana.

Products and processes of the factory

Compounding of organic pigments, starch-based sizing and finishing agents, starch-based adhesives, polythene printing, break fluid formulation, production of Turkey Red oil.

Effluents and waste products

Source	Quantity/day	Quality	Treatment & disposal
1. Starch plant	5 kg	Solid waste sweepings of starch etc.	disposed as solid waste
2. " "	750 gals.	wash water suspected to contain starch, H_2SO_4, HC1 preservatives, formalin COD - 2140 mg/1 pH - 1 TS - 25280 mg/1	disposed into public drain untreated.

3.	Pigment plant	5-10 gals	Wash Water containing pigments. COD - 2866 mg/1 pH - 3.5 TS - 3820 mg/1	Sedimentation, disposed into public drain
4.	Pigment plant	Unknown	Washings from pigment containers	No treatment, disposed into public drain
5.	Polythene printing plant	-	-	-
6.	Break - fluid plant	-	-	-
7.	Turkey Red oil plant	-	-	-

c) Baksons Textile Ind. Ltd,
Lady Catherine estate,
Maligawa Road,
Ratmalana.

Products and processes of the factory

Weaving, dyeing finishing and printing of Textiles

Effluents waste products etc.

Source	Quantity/day	Quality	Treatment & disposal
Dyeing and	12000 gal	wash water containing dyes, soda ash, detergent COD - 515 wg1/1 TS - 3790 mg/1 pH - 11.5	no treatment, disposed into public drain
Weaving plant printing	-	-	-

d) Lanka Weaving Mills Ltd;
Velona Industrial Complex,
Moratuwa.

Products and processes of the factory: Weaving, Dyeing, Finishing & Printing of Textiles.

Effluents waste products etc.

Source	Quantity/day	Quality	Treatment & disposal
1. Kier boiling washings (Fabric)	1500 gal 6000 gal	containing NaOH soda ash, detergent	no treatment, disposed into public drain
2. Bleaching washing (Fabric)	2500 gal	small amounts of Hydrogen peroxide and organic matter	no treatment, disposed into public drain
3. Kier boiling bleaching Dyeing (shoe lace etc.)	400 gal	containing NaOH soda and detergent dyes etc.	no treatment, disposed into public drain
4. Nylon Cotton dyeing and finishing	4500 gal	waste dye wash water containing Dyes etc.	No treatment, disposed into public drain
5. Screen printing	400 gal	Spent dye baths	no treatment, disposed into public drain
Composite sample of 1-5		COD - 1443 mg/1 TS - 1090 mg/1 pH - 7 T°C - 36	

E) Finishers and Dyers (Velona) Ltd.
Velona Industrial Complex,
Moratuwa.

Products and processes of the Factory

Bleaching, dyeing and finishing of textiles.

Effluents waste products etc.

Source	Quantity/day	Quality	Treatment and Disposal
1. Kier boiling	300 gals	Kier boiling liquid containing NaOH, Soda ash detergent.	No treatment, disposed into public drain
2. Kier boiling	300 gals	Wash water containing NaOH Soda ash, detergent and organic material.	No treatment, disposed into public drain
3. Bleaching plant	300 gals	Spent bleaching liquid containing hydrogen peroxide & organic materials.	No treatment, disposed into drain
4. Dyeing plant	80 gals	Spent dye, baths	No treatment disposed into public drain.
5. Dyeing plant	400 gals	wash water containing some dye stuffs.	No treatment, disposed into punlic drain
6. Starching	80 gals	Spent bath containing small amounts of starch.	No treatment, disposed into public drain
Composite sample 1-6		COD - 547 mg/1 TS - 1170 mg/1 pH - 9 T°C - 37	

F) Hybro Industries Ltd,
No. 2, Maligawa Road,
Ratmalana.

Products and processes of the factory

Bleaching, Dyeing and finishing of textiles 40,000 m/day.

Effluents waste products etc.

A) White Textiles

Source	Quantity/day	Quality	Treatment & Disposal
1. Kier boiling & washing.	1600 gals	Kier boiling liquid and wash water containing NaOH, Soda and detergent.	No treatment, disposed into public drain.
2. Pleaching plant	4000 gals	Bleaching liquid wash water containing bleaching powder.	No treatment disposed into public drain.

B) Coloured Textiles

Source	Quantity	Quality	Treatment & Disposal
Dyeing plant	1000 gal 25-50 gal	Wash water spent dye baths	No treatment, disposed into public drain.

Note:

Hybro Industries Ltd; has started negotiations for the purchase of water and waste water treatment plant from Tulsi Fine Chemicals (India) Pvt. Ltd; Poona. We were informed by the factory Manager that steps will be taken to install a suitable waste water treatment plant in the near future.

3. Information Supplied by Industrialists

In addition to the above information which was collected by us during visits to the respective factories following information was also received in response to questionnaires sent to industrialists in Moratuwa.

a) Ceylon Galvanising Industries Ltd;
Lady Catherine Estate Road,
Ratmalana.

Products and processes of the factory

Galvanising iron and steel sheets.

Effluents waste products etc.

Source	Quantity/day	Quality	Treatment and disposal
Galvanising plant	not given	Solution of acid.	Neutralized and disposed into public drain.
Flux waste	not given	solid	solid

b) Pfizer Ltd;
Ratmalana.

Products and processes of the factory

Manufacture of pharma-ceuticals

Effluents waste products etc.

No information given on effluents. Management has informed that their factory is not producting any fumes or liquid effluents hazardous to public.

c) Regals Textile Industry
60, Borupana Road,
Moratuwa.

Products and processes of the factory

Manufacturing of synthetic textiles and Garments. No dyeing and finishing of textiles carried out at the factory. Only weaving and sewing.

Effluents waste products etc.

No information is given on effluents. It appears that there are no hazardous effluents from this factory.

d) Glaxo Ceylon Ltd;
Ratmalana.

Products and processes of the factory.

Processing of food and pharmaceutical products (Milk food, Glucose, Medicines)

Effluents waste products etc.

Source	Quantity	Quality	Treatment and Disposal
-	One lorry load per week	Solid paper, refuse, tea	Dumped into a quarry at Dehiwela
-	300 gal/day	wash water	No treatment disposed into public drain

Rockitt and Colman of Ceylon Ltd,
Borupana Ferry Road,
Ratmalana.

No information on products processes or effluents has been supplied. Management has stated that their processes and products do not cause any industrial pollution.

F) International Garments Ltd,
P.O. Box 14,
Moratuwa.

Products and processes of the factory

Manufacture of Garments including gent's and boys shirts, ladies blouses etc.

Effluents waste products etc.

Remnant cloth, scrap etc. which are sold or burnt.

4. Conclusions and Recommendations

a) All the industries visited by CISIR officers, namely, Chemical Industries (Colombo) Ltd., Chemanex Ltd., Baksons Textile Industries Ltd., Lanka Weaving Mills Ltd., Finishers and Dyers Ltd., and Hybro Industries Ltd., had considerable amounts of high pollution causing effluents which need adequate treatment prior to disposal into public drains.

b) Out of the industries which have supplied information regarding their effluents, Ceylon Galvanishing Industries Ltd; and Glaxo Ceylon Ltd; appear to have effluents which need treatment before disposal to public drains. However, this has to be confirmed after visiting the factories.

c) Out of all the industries mentioned in this report only Chemical Industries (Colombo) Ltd; has attempted treatment of their factory effluents. This treatment although not a compbete one appears to be adequate as a preliminary treatment if the plant is maintained properly.

d) In this preliminary survey it is not possible to predict the exact level of pollution caused by the industries surveyed. However, it is apparant that a considerable amount of hazardous chemicals etc. are being disposed to the surroundings without treatment. Therefore, we feel that it is justified to continue to the preliminary survey in order to identify the industries which cause pollution hazards.

Once these are identified, steps have to be taken to study them individually in detail to assess quantitatively and qualitatively, the levels of pollution caused by their effluents. After this study, it will be possible for us to make recommendations for suitable methods of treatment.

Sgd.
Dr. P.M. Jayatissa,
Head,
Industrial Microbiology.